NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD (NITFS)
REQUEST FOR CHANGE (RFC)

RFC CONTROL NUMBER 95-056
(To be filled in by NTB Secretary)

DATE SUBMITTED 3/3/95 DATE RECEIVED 3/21/95

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ORGANIZATION TYPE. user

PRIORITY routine

FUNCTION operational

DOCUMENT NUMBER MIL-STD-2500 PAGE
DOCUMENT NITFS Format PARAGRAPH 5.9.2

PROBLEM DESCRIPTION
Add an optional Reserved Segment (RES) to detect changes or errors in the NITF file by means of a Cyclic Redundancy Check (CRC16). If present, this CRC shall be the last RES, and be located at the extreme end of the file.

RECOMMENDED WORDING
Proposed changes to section 5.9.2, including additional descriptive tables are attached. Subheader length (LRESHnnn) is 32 bytes and there is no data (LREnnn=0).

RATIONALE
To verify that NITF files of differing security classification levels have not been corrupted after they shared common storage, transfer, or communication media. CRC16 will allow verification that a file still contains the exact data it contained when created; that no data of a higher classification has inadvertently been inserted. CRC16 will also detect changes caused by defective archive media.

REMARKS
The specific Cyclic Redundancy Check mechanism chosen is identical to the Frame check Sequence (FCS) used by TACO2, and conforms to CCITT Recommendations V.41 and X.25. It is capable of detecting all error bursts of 16 or fewer bits, all errors involving an odd number of bits, and 99.998% of other errors (overall probability of a missed error is 1 in 2 to the 15th power).

TOTAL COST OF IMPLEMENTATION

PROPOSED TIMEFRAME OF IMPLEMENTATION

ANTICIPATED USER IMPACT

NTB REVIEW DATE 3/21/95 NTB RECOMMENDATION
SUBSTANTIVE ISSUES

DATE SUBMITTED TO ISMC
ISMC REVIEW DATE

DATE SUBMITTED TO DISA

ISMC DECISION

IMPLEMENTATION DATE

*Change section 5.9.2 as follows (deleted test is struckout, and added test is in **bold**):*

5.9.2 Reserved ~~extension~~ segments. Structure is provided in the **Reserved Segment Description Group of the** NITF file header to support up to 999 distinct ~~fields~~ **segments** of up 9999999 bytes plus a corresponding subheader of up to 9999 bytes for each ~~field~~ **segment**. The combination of each subheader and corresponding data field is called a Reserved Extension Segment. ~~These fields are reserved in that they shall not be present in any header until this standard is modified to define their use~~. **Within the Reserved Segment Description Group in the NITF Header Record is found the number of Reserved Segments (RES) in the file, the length of each RES subheader and the length of each corresponding RES data field. The type of data contained in each RES, and its subheader structure, is defined by the contents of the RESTAG field of its subheader; every RES subheader must contain RE and RESTID as defined in table XIX and table XX, but fields following RESTID may vary**.

TABLE XIX. Reserved Segment common subheader format

(R) = required, (O) = optional, AND (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RE	File Part Type	2	RE	R
RESTID	Reserved Segment type identifier	25	Alphanumeric	R

TABLE XX. Reserved Segment Common subheader field definitions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
RE	This field shall contain the characters "RE" to identify the subheader as a reserved extension.
RESTID	This field shall contain a valid alphanumeric Reserved Segment type identifier. This type identifier determines the format and structure of additional subheader fields and Reserved Segment data.

5.9.2.1 Cyclic redundancy check. The cyclic redundancy check (CRC) segment provides a decimal representation of a 16 bit binary number, and is used to detect changes or errors introduced into the NITF file during storage or transmission. When present, the CRC segment shall be the last Reserved Segment, and therefore shall be located at the extreme end of the file. The CRC is created by the generator polynomial:

$$\mathbf{g(x) = x^{16} + x^{12} + x^5 + 1}$$

This generator polynomial is identical to that described in CCITT Recommendations V.41 and X.25, commonly called CCRC-16. The polynomial error checking process extends across the entire file, from FHDR at the beginning of the file though the RESTID field for this segment. The format for this segment subheader is shown in table XXI and field descriptions follow in table XXII. The value in LRSHnnn of the File Header record for this segment shall be 32; the value in LRnnn shall be 0 - no data follows the subheader

TABLE XXI. CRC reserved extension segment subheader format

(R) = required, (O) = optional, AND (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RE	File Part Type	2	RE	R

RESTID	Unique RES type identifier	25	CRC-16	R
RECRC	CRC-16 check value	5	00000-66535	R

TABLE XXII. CRC reserved extension segment subheader field definitions

FIELD	**VALUE DEFINITIONS AND CONSTRAINTS**
RE	This field shall contain the characters “RE” to identify the subheader as a reserved extension.
RESTID	This field shall contain the characters “CRC-16” followed by 19 spaces
RECRC	This field shall contain the remainder produced by the cyclic redundancy calculation executied over the entire file, from FHDR to RESTID for this segment, inclusive, using the generator polynomial $g(x) = x^{16} + x^{12} + x^5 + 1$, expressed as a decimal number.